

Distributed Rocket Engine Testing Health Monitoring System, Phase I

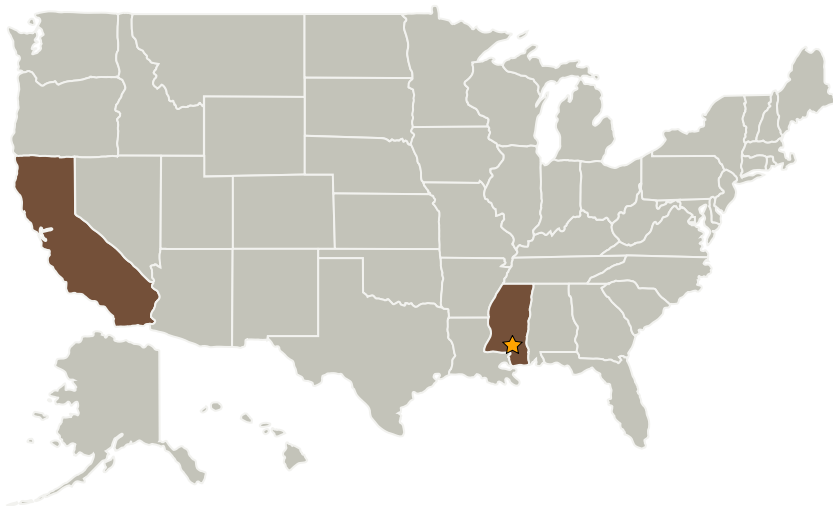
Completed Technology Project (2009 - 2009)



Project Introduction

The on-ground and Distributed Rocket Engine Testing Health Monitoring System (DiRETHMS) provides a system architecture and software tools for performing diagnostics and prognostics for supporting NASA's Integrated System Health Management (ISHM) capability for rocket engine testing and ground operations. DiRETHMS architecture consists of a hierarchical, modular, scalable, and flexible system structure for performing ISHM. A core version of the system will be demonstrated during the Phase I effort by performing diagnostics of auxiliary components in rocket engines. The building blocks of the DiRETHMS are: (a) Advanced Embedded Smart Sensors (AESS); (b) Health Monitoring Nodes (HMN), (c) Health Manager Unit (HMaU), and (d) Application Server with Man Machine Interface Man Machine Interface (AS-MMI). DiRETHMS architecture will provide a logic organization for embedding diagnostics at the following levels: (1) smart sensors based on UNCU; (2) Robust monitoring/diagnosis subsystem; and (4) system level Prognosis. The significant innovations of this project are: (1) Capability to provide the user with an integrated awareness about the condition of every element in the system, (2) Very flexible architecture of smart sensors that comply with state of the art standards for easy integration and customization, (3) System configuration for support root-cause analysis, and (4) Object-Oriented Bayesian Network for Uncertain Inference.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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| Organizations Performing Work | Role | Type | Location |
|-------------------------------|-------------------------|--|-----------------------------------|
| ★Stennis Space Center(SSC) | Lead Organization | NASA Center | Stennis Space Center, Mississippi |
| American GNC Corporation | Supporting Organization | Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB) | Simi Valley, California |

Primary U.S. Work Locations

| | |
|------------|-------------|
| California | Mississippi |
|------------|-------------|

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
 - └ TX13.4 Mission Success Technologies
 - └ TX13.4.5 Operations, Health and Maintenance for Ground and Surface Systems